

NON-PUBLIC?: N
ACCESSION #: 9501310304
LICENSEE EVENT REPORT (LER)

FACILITY NAME: TURKEY POINT UNIT 3 PAGE: 1 OF 3

DOCKET NUMBER: 05000250

TITLE: AUTOMATIC REACTOR TRIP\TURBINE TRIP DUE TO MAIN
FEEDWATER
CONTROL VALVE FAILING CLOSED
EVENT DATE: 12/26/94 LER #: 94-006-00 REPORT DATE: 01/20/95

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
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Specialist

COMPONENT FAILURE DESCRIPTION:
CAUSE: B SYSTEM: SJ COMPONENT: TD MANUFACTURER: F130
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED:

ABSTRACT:

On December 26, 1994, Turkey Point Unit 3 was in Mode 1 at 100% power. At 0141, Eastern Standard Time, the "C" main feedwater control valve failed closed. After the valve closed an automatic reactor trip/turbine trip occurred after a Steam Generator Water Level - Low Coincident With Steam/Feedwater Flow Mismatch trip signal was received. The valve closed because a screw terminal found loose on the "C" valve electro-pneumatic transducer caused an intermittent open circuit which resulted in a closed valve position demand to the feedwater control valve. The transducer was replaced. Operation of the valve was monitored prior to the trip and subsequent to the return of the plant to full power.

END OF ABSTRACT

I. DESCRIPTION OF THE EVENT

On December 26, 1994, Turkey Point Unit 3 was in Mode 1 at 100% power. At 0141, Eastern Standard Time, the "C" main feedwater control valve (FCV-3-498) SJ:FCV! failed closed. An attempt was made by the reactor operator to reopen the valve. A manual trip was ordered approximately 30 seconds after the initial "Steam/Feedwater Flow Mismatch" alarm, when the "C" steam generator level SB:LT! continued to decrease. However, an automatic reactor trip/turbine trip preceded the manual trip when a "Steam Generator Water Level - Low Coincident With Steam/Feedwater Flow Mismatch" trip signal was received. A screw terminal was found loose on the "C" valve electro-pneumatic (I/P) transducer (I/P 3-498) SJ:TD! which caused an intermittent open circuit resulting in a closed position demand to the valve. Due to the nature of the circuitry, both the manual and automatic valve controller SJ:LIK! positions at the control room console had no valve position control capability with the open circuit. Therefore, the feedwater control valve went to a fully closed position and could not be reopened by the operator.

The control room controller for the "C" main feedwater control valve has two positions; manual and automatic. The I/P transducer for the valve operator receives a 4 - 20 ma signal from a controller in the control room. The manual mode controls valve position directly by supplying a variable signal based upon valve position desired. The automatic control mode provides a signal based upon a steam generator level program. During the event, neither manual or automatic mode would control the position of the feedwater control valve.

Early on December 25, 1994 (the day before the trip) a Steam/Feedwater Flow Mismatch annunciator alarm was received. The feed flow recorder was noted to have spiked down to a 2.75×10^6 lb/hr from the normal 3.1×10^6 lb/hr. "C" Steam generator level went from 61% to 57% on the narrow range level recorder. Due to the intermittent nature of the open circuit on the transducer, manual control of the feedwater control valve restored level to the steam generator. A recorder was installed on the steam generator level control system allowing monitoring of inputs to the level control program. One other level control anomaly was seen on the recorder prior to the alarm and automatic trip received on December 26. That anomaly had the same effect on the control of the main feed water regulation valve as that received earlier on December 25 although no Steam/Feedwater Flow Mismatch annunciator alarm occurred.

II. CAUSE OF THE EVENT

An investigation of the valve closure position without a change in steam generator level control demand from the controller in the control room was conducted. The failure of manual control from the control room to change the main feedwater control valve position was also investigated. The investigations revealed that a loose screw terminal connection on the I/P transducer for the "C" valve may have caused an intermittent open circuit. With an open circuit at this 4 - 20 ma connection, a closed Position demand was sent to the valve by the I/P transducer. The valve closed regardless of the manual or automatic demand signal coming from the controller module in the control room. The open circuit would not transmit the 4 - 20 ma control room controller demand to the I/P transducer. The terminal strip on the transducer was mounted to the I/P by means of rivets. In the case of this transducer the rivet mounting was found loose, which may have contributed to the loose wire connection.

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III. ANALYSIS OF THE EVENT

The Updated Safety Analysis Report (UFSAR) analysis assumes a loss of normal feedwater to all steam generators due to the loss of the feedwater pumps or valve malfunction. In the December 26 event only the "C" steam generator was affected. In the analysis, the reactor trip is expected to occur due to a Low-Low Level in any steam generator or Steam/Feedwater Flow Mismatch Coincident with Low Level in any steam generator. In this event the latter trip occurred first immediately followed by the second. The analysis shows that following a loss of normal feedwater, the auxiliary feedwater is capable of removing the stored and residual heat, thus preventing either overpressurization of the reactor coolant system or loss of water from the reactor core therefore maintaining the plant in a safe condition. All systems functioned as expected during this event and therefore this event did not compromise the health or safety of plant personnel or the general public.

This event is reportable under the requirements of 10 CFR 50.73(a)(2)(iv).

IV. CORRECTIVE ACTIONS

1. The I/P transducers on the "A" and "C" main feedwater control valves were replaced with a new model with a different design wire connection. The "B" valve transducer had already been replaced and was inspected.
2. Operation of the "C" valve and its control circuitry was

monitored at a low power level prior to return to full power operation.

3. The Unit 4 main feedwater control valve transducers of the failed connection type will be replaced prior to the end of the next Unit 4 refueling outage. This outage is now scheduled to begin in March 1996.

V. ADDITIONAL INFORMATION

No other failures of this type have occurred during the past two years.

This I/P module with the loose connection was manufactured by Fisher Control Co. Inc. It is a model 546 electro-pneumatic transducer.

EIIS Codes are shown in the format EIIS SYSTEM: IEEE component function identifier, second component function identifier (if appropriate)!

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JAN 20 1995
FPL L-95-010
10 CFR 50.73

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: Turkey Point Unit 3
Docket No. 50-250
Reportable Event: 94-006-00
Automatic Reactor Trip\Turbine Trip Due to Main Feedwater Control
Valve Failing Closed

The attached Licensee Event Report, 250/94-006-00, is being provided in accordance with 10 CFR 50.73(a)(2)(iv).

If there are any questions, please contact us.

Very truly yours,

T. F. Plunkett
Vice President
Turkey Point Plant

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enclosure

cc: Stewart D. Ebnetter, Regional Administrator, Region II,
USNRC

Thomas P. Johnson, Senior Resident Inspector, USNRC, Turkey
Point Plant

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